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the people of NPA

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ESTABLISHING INTERNATIONAL CONTROL OF NUCLEAR EXPLOSIONS

A Statement by the NPA Special Project Committee on Security Through Arms Control

The following is a partial text of the NPA Special Project Committee on Security Through Arms Control statement on *Establishing International Control of Nuclear Explosions* which was issued July 21, 1958. The Committee's report is being printed as NPA Special Report No. 50. A previous report of the Committee, 1970 *Without Arms Control*, Planning Pamphlet 104, was published in May, 1958.

In the "Foreword" to the printed statement, NPA Chairman H. Christian Sonne states, "Since the NPA released this statement on July 21, several official documents have confirmed the findings and judgments of this Committee. . . . the technical consensus of the recent Geneva conference of experts have supported the Committee's general view regarding the technical requirements of monitoring tests; and the statements of the American government subsequent to the issuance of the Geneva report have to some extent paralleled the Committee's estimates regarding the requirements of military strategy and national interest. On October 31, the powers will meet again at Geneva in an effort to negotiate substantive agreements. NPA is now printing this statement in the hope that it will contribute to an understanding of the many problems at issue in these momentous negotiations."

THE UNITED STATES has already "broken" its 'disarmament package' in an April 29, 1958, proposal for aerial inspection in the Arctic zone. President Eisenhower has recognized the special nature of the nuclear test issue in proposing a joint scientific inquiry into the technological problems involved in a test suspension and in designating eminent scientists to represent the United States in this inquiry. There remains, however, the necessity formally to revise U.S. policy respecting the nuclear test issue.

After weighing the complex factors involved, we believe these basic considerations should be borne in mind in dealing with the nuclear test issue.

- The U.S. position should be fully consistent with the ideals and values for which our country has been admired. We should not permit ourselves to become associated with disregard for human life or the rights of others.
- The enhancement of the security of the United States and of the world is a fundamental purpose, and the nuclear test issue is to be judged primarily in this context.
- The current arms race, which is diminishing U.S. and world security, cannot be checked and reversed without effective controls. A nuclear test suspension with inspection and controls will be a step toward more comprehensive arms control

Needed: A New Approach to Overall Planning

• "Because of the permanency of the crisis and the complexity of the problems inherent in it, this Cold War situation calls for a new approach to over-all, long-range planning. We must establish far-sighted objectives and plans which will not be affected in a major way by short-term considerations. . . .

• "I believe we should establish a fourth major branch of our Federal Government—one that might be called the Permanent Council on Plans and Policies. This new branch—ranking in importance with the Legislative, Executive and Judicial branches—would have responsibility for over-all planning. . . .

• "The primary function of this Permanent Council would be to formulate our long-range objectives, policies, programs, and strategy as related to the total needs of the nation. Unlike the other three branches of Government, this new one would look primarily to the future."

From an address by John L. Burns, President, Radio Corporation of America, delivered before the 50th Anniversary Conference of the Harvard Business School Association, Boston, September 6, 1958.

Correction

The excerpt entitled "Excellence and Education," which appeared in this column in the September issue, was erroneously attributed to Dr. Robert W. Van Houten. Dr. Van Houten, in his address at the S.A.M.-A.S.M.E. Conference, was quoting from a speech by Dr. John W. Gardner, President of the Carnegie Corporation for the Advancement of Teaching, delivered before the Association of Urban Universities, Detroit, November, 1957.



measures. Further, inspection, if carried out in good faith by all parties, will increase contacts and understanding, will diminish fears and uncertainties, and will generally accelerate evolution toward a more stable international order.

- Certain types of nuclear explosions in the future may contribute to the well-being or security of mankind. There must be a mechanism whereby the world community, rather than individual nations, can evaluate and authorize future nuclear explosions for internationally approved purposes.

IN CONSIDERING the effects on the security of the United States from continued tests, one must evaluate the security effects from continued tests by Russia and by an increasing number of other nations, as well as tests by the United States.

According to available evidence, the United States probably leads Russia in nuclear bomb know-how. Many scientists, military leaders, and government officials, who have access to classified information on U.S. nuclear technology and to intelligence reports on Soviet technology, have made public statements to this effect. The United States has tested about twice as many times as Russia, and the United States has been working on nuclear bombs four years longer than Russia. Moreover, there is no public evidence that Russia has yet experimented with so-called "clean" thermonuclear bombs, which might indicate she is still concerned with less advanced designs.

Thus, an enforced, early freeze on testing might well leave the United States in a position of some technological superiority.

There is still the point of a possible innovation not now foreseen. As for the supposition that the United States is more likely to make a radical innovation in bomb technology than is Russia, there is little evidence to support this assumption. For example, although the U.S. technical lag has apparently since been overcome, the Russians tested an actual thermonuclear bomb before the United States did, using a technique quite different from the cumbersome method of the first U.S. thermonuclear device. If testing continues in an unlimited fashion on both sides, we believe the Russians are as likely as the United States to achieve some radical innovation—if such is, in fact, possible.

Of course, if surreptitious testing were possible and if Russia chose to cheat, she could perhaps surpass the United States in bomb technology. We believe, therefore, that the reliability of the monitoring system is important, that it should be tested by actual explosions, and that the United States should not agree to prolonged suspension of weapons explosions which cannot be detected and reliably identified by the system.

An international agreement to suspend test explosions binding on all nations would tend to prevent the spread of nuclear capability to new nations.

A major characteristic of our age is the rapid growth of industrialization and technology. Today, three nations possess nuclear military capabilities. It is likely that in 25 years, barring either catastrophe or agreement, many more nations will have nuclear bombs. Long before a nation acquires sufficient bombs and delivery systems and integrates these into a war-waging capability, it can have the few crude bombs and special delivery systems which will enable it to cause general international mischief and even start a nuclear war between two other countries. Thus, the number of nations who can catalyze a nuclear war will exceed the number of nations who can wage nuclear war. The interests of both the United States and the Soviet Union require a slowdown of the rate of spread of nuclear-military technology.

THIS COMMITTEE believes that the security of the United States not only requires an ability to deal with direct nuclear attack upon the United States or its allies, but also an ability to deal effectively with mass conventional attacks and with brush fire attacks on the periphery of the free world and with limited war situations. We believe that the United States must be fully capable of defense against mass conventional and limited attacks as well as against nuclear attacks.

The United States has a counter-force strategy as well as a retaliatory strategy to deal with a direct Russian nuclear attack. (That is, in the event of war, we plan to destroy Russian striking forces in addition to cities.) While the counter-force element of our grand strategy has been valid for the 1950's, when Russia has had relatively few and vulnerable intercontinental weapons of mass destruction, it has serious disadvantages for the missile age:

- It demands an accelerated arms race, with the United States striving for overwhelming qualitative and quantitative superiority over Russia's numerous and increasingly invulnerable forces.
- It demands an instant response and therefore tempts pre-emptive action.
- Our will to use this retaliatory force, if necessary, may become eroded through contemplation of the enormity of the resulting human catastrophe. Thus, our deterrent might be dangerously weakened.

A purely retaliatory strategy against key Russian industrial complexes can by itself soon provide adequate deterrence against a Russian attack against the United States as it can be based on essentially invulnerable retaliatory forces, such as small, dispersed, underground, or mobile missiles.

A purely retaliatory strategy requires only enough destruction to deter Russia from direct nuclear attack on the United States. The delayed reaction will allow safe evacuation of populations. Thus, the U.S. will to use deterrent forces (when necessary) and the credibility of the retaliatory deterrent can be maintained. The Polaris and Minute Man rocket weapons now being developed will provide the United States with an adequate and invulnerable

retaliatory force for this purpose.

THERE ARE a number of factors which strongly suggest that U.S. security will not likely be enhanced through nuclear testing to improve its space defenses.

The first point has to do with the basic purpose of military defensive action. The value of a pure defense cannot be measured in terms of the desirability of absolute protection—a 100 percent perfect defense has never been possible. The value of defensive action lies rather in the higher price which it exacts for successful offensive action against it compared with the cost of the defensive action.

Secondly, the feasibility of space defense against nuclear rocket attack does not appear to depend on nuclear tests. The problems do not lie so much with the adequacy of present warheads as with the electronics of the system—for detection, identification, computation, guidance, and interception in a very short time.

In general, the United States already has low-yield weapons in a considerable variety of packages. Further testing of low-yield weapons might gain greater efficiency in the weapons. But this does not appear sufficient to offset the major gains in security which might flow ultimately from an enforceable prohibition of weapons explosions.

Tests by Russia and, more particularly, by other countries, are more likely to reduce U.S. security than U.S. tests are to improve it.

Furthermore, U.S. security will in the future depend more on inspection and the "opening up" of Russia than on improving nuclear capabilities beyond those we now have.

A TEST AGREEMENT makes sense only if it can assure essential compliance by all parties.

The current Geneva meeting of scientists should help to clarify our understanding of test detection and identification. However, present knowledge leads us to believe that most nuclear tests are detectable. Public knowledge, based on nonsecret instruments, indicates that general location, size, and in many cases identification of explosions over 5-kilotons TNT equivalent can be determined from fixed stations several hundred miles distant. In addition, over a 10-year period, there has been considerable development of the art of test detection on a classified basis, and much of this may become public after the Geneva meeting.

At the present time, there reportedly exist about 100 seismic stations in Russia and a corresponding number in the United States. A number of such an order, if properly located and provided with special instruments, would probably suffice to detect explosions in these countries.

Because we have no assurance of the efficiency of detection and identification processes operating over greater distances than several hundred miles, we feel that the Chinese mainland must be subject to inspection. Otherwise, Russia might, as already reported, conduct certain tests in that vast territory. Our national security, if depend-

ent on an effectively inspected test suspension, thus requires that the government which controls the Chinese mainland be a party to an agreement to suspend bomb tests and that mainland China, no less than Russia, be subject to inspection. Russia might, by similar reasoning, make demands for the inclusion of countries of the free world, and these demands should be recognized as legitimate.

WE URGE that the United States continue to stress that a test agreement be followed by broader and more comprehensive arms controls. It should maintain steady diplomatic pressure in this direction.

At the London meeting of the U.N. Disarmament Subcommittee in 1957 the Russians made a concession regarding a system of inspection on Soviet territory to monitor a test suspension agreement. The unwillingness of the Russians to admit international inspection teams has, for twelve years, been a major roadblock to disarmament agreement. This Russian concession, therefore, should be diligently pursued. A diplomatic breakthrough on inspection is central to the cessation of the arms race. Mutual inspection for bomb tests may well prove to be the beginning of a meaningful inspection for the prevention of surprise attack and other arms control measures. It may also help to allay suspicions and tensions and may result eventually in the opening up of Russia to freer and more normal contact with foreign nations.

A cessation of the weapons race will not end the determined contest between the free world and the rulers of Russia. It will only transfer it to other areas of competition. We have full confidence, however, that the resources of freedom—intellectual, political, ideological, human, and economic—can meet this challenge.

(Copies available from NPA. Special Report No. 50, July 1958, 40¢.)

Members of the Committee on Security Through Arms Control signing the statement are:

RICHARD S. LEGHORN—Chairman; President, Itel Corporation
JEROME H. SPINGARN—Secretary; Attorney, Washington, D. C.
ARCHIBALD S. ALEXANDER—Bernardsville, N. J.
HARRISON BROWN—Professor of Geochemistry, California Institute of Technology
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ROBERT C. TAIT—President, Stromberg-Carlson Company, Division of General Dynamics Corporation
WAYNE CHATFIELD TAYLOR—Heathsville, Va.
ROBERT C. TUCKER—The Rand Corporation
DAVID J. WINTON—Chairman of the Board, Winton Lumber Company
ARNOLD S. ZANDER—President, American Federation of State, County & Municipal Employees, AFL-CIO

—The People of NPA—



Chase Ltd., Photo

Joseph
D.
Keenan

Starting his career as a cable splicer for the Chicago Telephone Company, Joseph D. Keenan, NPA Labor Committee member, rose from the rank and file to become International Secretary of the International Brotherhood of Electrical Workers thirty nine years later. First elected to office in Local Union 134 as inspector, during his long association with the labor movement he has been Secretary of the Chicago Federation of Labor, Secretary Treasurer of Building and Construction Trades Department for the American Federation of Labor, and since 1955 a member of the AFL-CIO Executive Council.

Mr. Keenan has contributed his experience and abilities to public service at both state and national level. As a member of the Drafting Committee of the Administrative Procedure for Unemployment Compensation and member of the Advisory Committee until 1945, he served his home state of Illinois. During World War II, he served the country in many capacities. First appointed American Federation of Labor Representative on the National Defense Council, he later acted in the same capacity in the Office of Production Management. When the War Production Board was set up, Mr. Keenan was made Associate Director, then Vice Chairman of Labor Production.

Post war years saw Mr. Keenan in Germany as Labor Advisor to General Clay, helping reorganize German trade unions. Returning to the United States he was appointed Acting Director of Labor's League for Political Education. He continues to serve the government as an Assistant to the Director of the Office of Defense Civilian Mobilization.

Mr. Keenan is on the Board of Directors for ACTION (American Council to Improve Our Neighborhoods) and the Executive Committee of the American Arbitration Association.

Consumer Behavior: 1958-65

LONG-TERM consumer trends and their implications for business between now and 1965 are the subject of a recent report by the Foundation for Research on Human Behavior, *Trends in Consumer Behavior: The Next Ten Years*. The report considers population trends, labor force, age distribution, family composition, suburban growth, productivity, output, prices, education, and other important factors which will shape the markets in the next ten years.

According to the report, the most predictable component of the picture for 1965 is the population itself—its composition by age groups, marital status and stage in the life cycle, and its location.

Because of the projected increase in the proportion of oldsters and teenagers in the total population by 1965, it is expected that the present distribution of income among spending units will be considerably altered. Presumably the pattern of consumer demand will change accordingly, quite apart from expected increases in average income, according to the report. The effects of social security and pension plans will be a major factor in maintaining stability of incomes over the life cycle and from year to year. Consequently, income from which discretionary purchases can be made is expected to rise still further and to be a proportionately larger fraction of consumer disposable income, during the next decade.

OTHER FACTORS entering into projections of desires and buying patterns of consumers include rising levels of taste, more suburban living, more leisure, and more education. The study asserts that there is every reason to expect that family pressures for college training will be much stronger in 1965 than today. All these factors are seen as pressures for higher quality, better design, more services, and for continued expansion of consumer demand.

Projections of possible production in 1965 are more difficult, and the report points out that no recent period in American history seems to qualify as a normal base for projections. However, there seems to be no strong technological or resource reason for productivity and output to average less than the past rates of progress. Total gross national product for 1965 is estimated at \$565 billion (3.5 percent annual increase in output, at constant 1956 prices).

The report concludes that if manufacturers and merchandisers continue to improve their products and services, in quality, in styling and taste, and in convenience to the consumer—and if consumers do not become dissatisfied because of rapid price increases or worried because of uncertainty about the future—then consumer demand can provide the basis for an American economy of unprecedented size and prosperity in 1965.

(*Trends in Consumer Behavior: The Next Ten Years*, the Foundation for Research on Human Behavior, Ann Arbor, Michigan: 1958, 50 pp., \$3.00.)

A European Look at Farm Management in the United States

"**A**GRICULTURE SHOULD SEEK to achieve productivity from its resources comparable with that of other industries." With this premise in mind, a group of thirteen European farm management advisory workers, representing six different countries, examine farm management techniques employed in three states—North Carolina, Illinois, and Minnesota.

The examination of procedures and techniques used to help farmers arrive at sound business decisions points to the important function of extension workers in teaching sound business methods to farmers, and providing them with technical and economic information, so they can utilize these business methods, the report states.

The report briefly examines two trends in the economic history of American farming. The changing pattern of costs and output relative to farming shows that the trend has been away from self-sufficiency and toward a complex cash sale business with increasing requirements for managerial skill and business prudence, as well as technical competence in field and stock work.

Along with this change has come a persistent reduction in the margin available to cover errors of management. An increasing proportion of the value of farm output has been required merely to cover cash costs. There has also been heavy substitution of capital for labor in American farming, so that today each farm worker is using nearly three times the value of capital equipment than was the case even as recently as the 1940's. This increased value represents an expansion of actual physical resources of some 70 percent.

A CONSIDERATION of resources used in U.S. agriculture shows that the average size of U.S. farms was 242 acres in 1954, as compared with 174 acres in 1940. Thus, the report points out, it appears that management problems are most pressing on the less productive farms in the smaller acreage groups.

Assessments of land, labor, and capital resources show that both farm labor and capital are becoming more scarce and expensive. The report bases this conclusion on the decreasing investment in new capital assets. Figures available for bank loans to agriculture suggest that only between one fifth and one quarter of the total are secured against farm real estate. The great bulk of these bank farm loans in the United States are personal loans or are secured by collateral other than real estate—for example, livestock and farm machinery. The magnitude of different

types of farm credit available in the United States seems to indicate that U.S. farming is still a good credit risk, the report points out.

AN EVALUATION of methods of record and account keeping, and of budgeting is included in the report, together with a survey of methods of presenting farm management to farm people. The European representatives recommend that farm management research concentrate less on processing results of groups of annual accounts and more on refining knowledge of economic relationships which hold true over a longer period.

The report also recommends that every effort be made to provide advisors with in-service instruction and courses in up-to-date farm management procedures, which extension workers should be encouraged to attend.

Other reports published by the OEEC dealing with related farm subjects are "Agricultural Advisory Services in Europe and North America, 1957," and "Manual on the Preparation of National and Regional Handbooks for Use in Farm Management Advisory Work."

(*Farm Management in the United States*, Organisation for European Economic Co-operation, Paris: March 1958, 130 pp., \$1.00.)

NPA is saddened to lose a good friend, Howard R. Tolley, member of NPA's Agriculture Committee and consultant for various NPA special projects, who died on September 18, in Alexandria, Virginia. A noted agricultural economist, and at one time chief of the Bureau of Agricultural Economics in the Department of Agriculture, Mr. Tolley represented the U.S. government in many international agricultural conferences. He was an American delegate to the conferences that established the Food and Agriculture Organization of the U.N., a member of the Interim Commission that drafted the constitution and program for that organization, and the first chief of its economics and statistics division. He has served as an advisor to the Pakistan Planning Board, and as consultant to the Ford Foundation.

Peaceful Uses of Nuclear Energy

by Philip Mullenbach

*Research Director, Nuclear Energy Study
The Twentieth Century Fund*

THE OCTOBER 1955 "Looking Ahead" carried some brief observations of mine on the first international conference on the peaceful uses of nuclear energy. Now, three years later, on the close of the second Geneva conference, we take stock again both of the conference and other recent international developments in this field.

The Conference

These seem to be the most significant results of the 1958 Geneva conference:

- In contrast to the technical domination of the first conference by the atomic leaders—the United States, the United Kingdom, and Russia—this time other countries, notably France, Germany, and India, also contributed a large number of significant technical papers. The big gap between the advanced and less developed countries, atomically speaking, is less noticeable now.
 - The total declassification of research in controlled thermonuclear reactions (fusion) was announced at the outset of the conference. This action was welcomed, representing belated recognition of scientific realities and the long-standing sympathies of leading scientists in the field. Publication of work on plasma physics has revealed the scope of present national efforts; it has also indicated the many years' work required before a net power producer is likely to be achieved.
 - Reports on future economic benefits of U.S. experiments with nuclear explosions were received with undisguised scepticism by many neutral and western observers. Communist bloc scientists did not fail to take advantage of this political opening to suggest that nuclear explosions for this purpose might undercut the precarious progress made toward ceasing weapon tests.
 - Finally, the Conference revealed only nominal advances had been made since 1955 in moving nuclear power closer to competitive reality. Indeed, the target appeared little closer to achievement than in 1955 and estimates of nuclear power cost still were not firm. The gap between technical and economic feasibility appears as large as ever and prompts heavy governmental assistance everywhere.
- Meanwhile, despite the lack of firm cost figures, national

plans for reactor construction were proceeding apace. In Italy the SENN Project announced selection of General Electric as contractor for the 150 MW plant to be financed in part by the World Bank; a West German governmental group asked for bids on a 200-235 MW plant; the Netherlands was testing the market by asking bids on a 150 MW plant; the Development Bank of Cuba was negotiating with a joint U.S.-U.K. group to construct a 20 MW plant in a remote section of the island; several other deals were also being discussed.

The second International Conference, then, was merely one event among other momentous international developments occurring elsewhere in Europe during the summer of 1958. Rapid advances were being made by several international agencies to "organize" the atom and achieve its peaceful benefits without jeopardy. Euratom, and the Organization for European Economic Cooperation and the International Atomic Energy Agency, each approaching the peaceful atom in a different way—as is to be expected considering the unique purposes and circumstances of each agency—are together forming an intricate pattern of international control and promotion.

Euratom

After long preparation and astute negotiation, the Joint U.S.-Euratom agreement was overwhelmingly approved by the Congress in August, providing the newly formed supranational agency part of the resources needed to start a one million KW demonstration program. This agreement, providing much needed new vitality to and partial reconciliation of our foreign and domestic power reactor programs, is aptly described as the most important international advance the nation has made since the 1954 Atomic Energy Act was passed.

Some hurdles still remain: a very sensitive policy issue is the manner of coming to mutual agreement on inspection and control procedures that are consistent with both existing U.S. bilateral arrangements and prospective procedures of the International Agency. Though opinions differed on this question, it was apparent in Vienna that U.S. concurrence in Euratom inspection and control, essentially separate from IAEA, had not strengthened the prospects for acceptance of international inspection by IAEA teams in other areas. Yet, the Euratom safeguard

system may be making solution of the IAEA problem easier by encouraging similar regional approaches elsewhere. A further question to be resolved is how Euratom may secure the participation and assistance of the United Kingdom—which has been plainly disturbed by the implications of such heavy U.S. aid.

European Nuclear Energy Agency (OEEC)

The 16-nation OEEC, adhering to the principle of national cooperation rather than requiring the transfer of sovereignty, is following a carefully chosen complementary course to that of Euratom. Progress is being made toward common facilities (Eurochemic) for chemically processing irradiated fuel elements and toward an indispensable convention for third party liability. Full agreement on respective inspection and control responsibilities, as between Euratom and OEEC, is still ahead, but the complementary working relation of the two agencies appeared much clearer than in 1955.

International Atomic Energy Agency (IAEA)

The IAEA, it should be recalled, was the key piece in the President's December 1953 atoms-for-peace proposal. Yet, it was with real misgivings that I visited Vienna after the Geneva Conference. For, in moving from Brussels to Luxembourg to Paris and to Geneva, I had heard numerous accounts of the problems plaguing this specialized Agency. My misgivings, unfortunately, were confirmed. The IAEA appeared to be a confused and confusing agency, only partly explained by the shackles placed on it by the charter and by the Preparatory Commission.

The central problem was—and, indeed, may still be—the fact that the IAEA had found, or been assigned, no essential international function to perform. Not knowing what it might best be doing, the agency appeared to be drifting and taking no evident action on the major problems, for example, of establishing "safeguards" (a euphemism for inspection) and controls, and of promoting the application of nuclear power in less developed regions. In conference corridors all across Western Europe to Vienna a leading topic of speculation was finding a function that the IAEA would be capable of performing and, more important, would restore a strong sense of mission. The possibilities ranged from the difficult—for example, weapon tests monitoring—to the easy—"registration" with the IAEA of production and shipments of natural uranium and thorium.

Meanwhile, representatives of the less developed countries had become disappointed and disheartened by the Agency's obvious unwillingness to come to grips with the special situation represented by their economies. Leadership in the IAEA was diffused among the three atomic powers, and these appeared to be taking a deliberate "go slow,"

minimum-effort attitude, while the less developed countries appeared to be losing hope in the Agency's ability to get on with the task. Several Europeans, somewhat cynically no doubt, expressed the view it was sufficient the IAEA "existed"—and to expect more, soon, was being unrealistic.

How to maintain the viability of the IAEA during the next couple of years appeared to be a policy question that the United States, more than any other country, would have to decide within the next few months. Vienna was looking mainly to Washington to resolve the question whether the agency would continue to drift or take a firm, well-defined course aimed, first, at achieving effective international control and, second, at establishing a concrete nuclear energy program for less developed countries.

Summing up

The mountain of technical trivia presented at Geneva provided scarcely any perspective on future nuclear energy development. The economic prospects for nuclear power are still uncertain and obscure. Indeed, the controlling considerations were a different sort, being primarily political and social, rather than economic, as nations and groups of nations began to organize for nuclear energy to achieve objectives that were remote from energy per se.

Euratom, with the strongest support of the U.S., is successfully using the leverage of agency sovereignty in the ownership and control of fissionable material to further the integration of Western Europe. Similarly, OEEC, requiring no national relinquishment of sovereignty, has chosen special aspects of nuclear energy to strengthen the widest cooperation among Western European nations—neutral and non-neutral. Among the less developed (and neutral) countries the aim is to fit nuclear energy into the existing framework of national policy—to achieve rapid economic development but, also, to promote fullest use of indigenous resources. India in the East and (possibly) Brazil in the West are becoming the leaders of this new expression of national nuclear energy development independent of major assistance by the atomic powers.

RIVER DEVELOPMENT IN AFRICA

THE PROBLEM of harnessing two of the world's great rivers is presented in a recent issue of *The Way Ahead*. In the hope that the Niger, which flows through French West Africa and Nigeria, and the Benue River, which joins it in Nigeria, will one day serve Africa as the Rhine serves Europe or the Mississippi serves the United States, Dutch experts have been engaged in a three-year exploration study of the navigability of these rivers.

Intensive exploration, begun in 1955, of the Y shaped sprawling Niger-Benue complex has already indicated practical solutions for many of the hydrological problems encountered. The full report containing results and recommendations should be finished toward the end of 1958, after observations have been taken during three river seasons. Preliminary reports to the Nigerian Government indicate proposals which could be put into operation immediately, including a navigational aid system which has been partially installed and is proving most effective.

IT IS NOTED that recent reports of successful oil finds give Nigeria optimistic hopes of a new source of national income. Should these hopes be realized, cheap water transport such as the Niger and Benue could provide would be most useful, not only for such an industry, but for the economy as a whole.

(*The Way Ahead*, Stichting Bouw, Rotterdam: Vol. 7, No. 2, 1958, 32 pp.)

New Bibliography

Decision-Making

Decision-making, an area of management concern, is the subject of a new annotated bibliography published by Cornell University Graduate School of Business and Public Administration. Descriptive abstracts of English language books, articles, and documents which are representative of the literature in this field are separated into social, mathematical, and philosophical fields.

The coverage includes the decision-making process—general and theoretical material; values and ethical considerations in decision-making; leadership as a factor in decision-making; psychological factors in decision-making; decision-making in small groups; community decision-making; and communications and information handling. Decision theory, game theory, and operations research sources are also covered.

The bibliography, which is designed to serve both academic and business interests, also includes a complete author index and title index.

(*Decision-Making, An Annotated Bibliography*, Paul Wasserman and Fred Silander, Graduate School of Business and Public Administration, Cornell University, Cayuga Press, Inc., Ithaca, New York: 1958, 118 pp.)



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